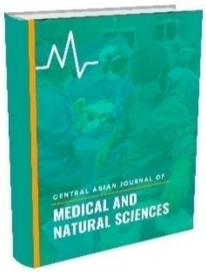
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Comprehensive Clinical Examination of the Oral Cavity in Children with Type 1 Diabetes Mellitus

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Abstract: The article assesses the impact of type 1 diabetes mellitus on the state of the oral cavity in children. The survey was conducted in 35 children and adolescents with type 1 diabetes. In children with type 1 diabetes, multiple carious teeth, periodontal syndromes, aphthous manifestations of stomatitis and various types of cheilitis were found. Along with clinical studies, such indicators as KPU, KPU + kp indices, hygienic index according to Fedorov-Volodkina, PMA and CPITN were determined.

Key words: Diabetes, mucosa, periodontal, gingivitis, cheilitis.

The results of epidemiological studies conducted International Diabetes Federation (International diabetes Federation , IDF) in more than a hundred countries of the world indicate that type 1 diabetes (diabetes mellitus) ranks first among endocrine pathologies in the child population, with a trend towards a steady increase in the incidence, which formed the basis for the adoption of regulatory international acts aimed at fight against endocrinopathy [6] .

Pathological processes that occur in the pancreas in type 1 diabetes in children are to some extent reflected in all tissues of the body, but the earliest and quite clearly expressed disorders are determined on the mucous membrane of the oral cavity and the dorsal surface of the tongue . A significant place in the domestic and foreign literature is given to the study of the manifestations of diabetes mellitus in the oral cavity, at the same time, many aspects of the mechanisms of these relationships remain insufficiently studied. The high prevalence of type 1 diabetes among children, the complexity of its early detection make it very relevant to solve problems associated with the early diagnosis of this pathology [2,5].

Due to the fact that the functions of the salivary glands are most closely related to the processes in the whole body, the use of oral fluid as a biological object for non-invasive diagnosis of type 1 diabetes in children is promising. At present, the problem of using oral fluid to diagnose type 1 diabetes in children has not been fully studied and is of interest to both researchers and practitioners, especially pediatricians [7,9].

Thus, an in-depth study of the dental status and identification of important diagnostic criteria in the oral cavity in type 1 diabetes in children can be of no small importance for the timely establishment of a general diagnosis and referral of a child to an endocrinologist [12,15].

Purpose of the study

Conduct a comprehensive clinical study of the oral cavity in children with type 1 diabetes mellitus to improve the effectiveness of its early diagnosis by dental status.

Materials and research methods.

In the course of the work, a comprehensive dental examination was carried out in 35 children and adolescents with type 1 diabetes aged 7-17 years (boys-18, girls-17), who were treated at the Republican Specialized Scientific and Practical Medical Center of Endocrinology. All examined were divided into 2 groups: control and patients with type 1 diabetes. A comprehensive examination of the oral cavity included the identification of patient complaints, anamnesis, visual examination and index assessment (indices KPU, KPU + kp , hygiene index according to Fedorov-Volodkina ,

PMA and CPITN) of the oral cavity.

Research results.

Patients with type 1 diabetes complained of general malaise, weakness, fatigue, decreased performance, decreased appetite and, along with this, body weight. Children were worried about frequent urination, increased thirst, and bad breath.

85% of the examined children noted a decrease in salivation (hyposalivation) and dry mouth. In 17% of children, we noted damage to the skin by the type of allergic dermatitis, especially pronounced in the region of the corners of the mouth.

In the process of finding out the causes of the disease, it was found that in 38% of cases it was caused by a stressful situation (exams, quarrels, conflicts in the family, etc.), in 15% of children, the first symptoms arose after a viral infection, and only 7% of children have hereditary predisposition to DM. 40% of the surveyed did not associate the onset of the disease with any factor.

The main complaints about changes in the maxillofacial area in the group of patients with type 1 diabetes included: dryness (85%), bleeding gums when brushing teeth and eating (97.3%), changes in the appearance of the red border of the lips and corners of the mouth (67 %).

The results of a comprehensive examination of the oral cavity in patients with type 1 DM indicate a significantly higher prevalence of major dental diseases compared to patients in the control group. Attention is drawn to the high percentage of prevalence of caries in patients with type 1 diabetes, while it is noted that in children with a compensated form of pathology, the percentage is lower (77.7%) than in the decompensation stage (91.1%), but higher than in the control group - 63.3%.

When examining the oral cavity in children with DM 1, we noted a higher incidence of dentition anomalies (0.17+0.09) compared with the control group (0.07+0.09; $p < 0.05$). Malocclusion was often observed in patients with type 1 diabetes and its average value was 0.73±0.11 patients with type 1 diabetes, which is higher than in practically healthy children (0.55±0.18; $p < 0.05$). It should be noted that high values of the KPU index were observed against the background of an unsatisfactory hygienic state of the oral cavity . When examining the oral cavity in children suffering from type 1 diabetes, the presence of dental deposits and bad breath was noted.

The data obtained indicate that a very poor level of hygiene was more common in the group of sick children in 5.71% of cases, while in the control group it was 3.33%. A good level of hygiene was most often noted in 43.33% of healthy children, 31.43% in the group with type 1 diabetes. The low level of

oral hygiene contributed to the development of inflammatory diseases of periodontal tissues. The prevalence of gingivitis in the group of children with type 1 diabetes was significantly higher than in the control group, this figure was 97.4% , while the catarrhal form prevailed (84.2%), and the hypertrophic form occurred in 13.2% of cases. Periodontitis in this group was diagnosed less frequently, in 2.6% of children with type 1 diabetes, while in the control group there was no such periodontal lesion. In the control group, only in 9 people, we noted damage to periodontal tissues in the form of catarrhal gingivitis of mild severity. The average value of the PMA index in the group of patients with type 1 diabetes was 26.40±1.02, and the average degree of inflammation was observed in 35 (50%) patients, in 10 (14.2%) - mild, in 3 (4.2%) - severe. The absence of inflammation was found only in 2 children with type 1 diabetes.

The value of the PMA index in the control group of children was 22.96±1.42%, which is significantly lower than in patients with type 1 diabetes.

When conducting a survey of the state of periodontal tissues, we assessed the need for treatment according to the CPITN index in patients with type 1 diabetes and the control group. The average value of the CPITN index in the group of patients was 1.21 ± 0.17, which is significantly higher than in the control group - 0.30 ± 0.11 ($p <0.05$). Analysis of the CPITN index values in children with type 1 diabetes indicates their need for treatment of periodontal diseases.

When examining the oral cavity in patients with type 1 diabetes, the first thing that attracts attention is a change in the color of the mucous membrane in children : pale pink in 45.71%; pink -33.33%; bright pink occurred in 10% of cases and red color was noted in 1.43% of patients. In the control group, the pale pink color of the mucous membrane prevailed (63.33%). In our observations, mucosal edema was noted in 21% of patients with DM, which was found in the form of imprints of teeth on the buccal mucosa. mucous membrane of the oral cavity and the red border of the lips. When examining the control group, edema was noted only in 5 children (16%) . As can be seen from the above data, in the group of patients with type 1 diabetes, a significant number of people with dryness in the oral cavity, a decrease in its moisture content are found, which is associated with impaired function of the salivary glands by the type of hyposalivation .

Erosive and ulcerative lesions of the oral mucosa were noted by us in 16% of patients with type 1 diabetes, while this pathology was not detected in the control group. According to the results of our observations, diseases of the mucous membrane of the red border of the lips were diagnosed in 67% of the examined patients. In patients with type 1 diabetes, atopic form of cheilitis prevailed (61.70%), exfoliative cheilitis (dry form) was 29.80% and in the stage of exudation (4.30%); eczematous occurred in 2.10% of cases. In the control group of children, lip diseases were observed in 2 children, with an atopic form occurring. When examining the red border of the lips in patients with type 1 diabetes, we also noted damage to the skin of the corners of the mouth in 7% of cases and often in combination with damage to the skin. In the examined patients, cracks are observed in the area of the corners of the mouth (10%), which are sharply painful, poorly amenable to therapy and prevent rational oral hygiene.

Conclusions.

Thus, the study of the state of the oral mucosa and its topological and morphological parameters and characteristics suggests the presence of type 1 diabetes in a patient from the initial period of its development. In addition, this study helps to carry out additional control over the course of the disease, assess the prognosis and the effectiveness of its treatment.

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